The Northwestern MILLER

MILLING PRODUCTION SECTION

Finland Builds A Flour Mill

One of the most modern flour mills in the world was opened at Hameenlinna, Finland, recently by "Osuustukkukauppa," better known as OTK, the Finnish co-operative wholesale society. Because the people of Finland consider the machines which grind flour as being among their most important possessions, the grand opening was surrounded with appropriate ceremony.

There were speeches, unfurling of the flags of two nations and the co-operative's banners, and even a full-blown military band. A large Union Jack was prominently displayed in tribute to Thomas Robinson & Son, Ltd., Rochdale, England, the firm which constructed the flour mill. The Robinsons were represented at the ceremony by C. S. Robinson, managing director; D. W. Povey, technical executive, and F. G. Boon, chief erector.

The initial operation of the Hameenlinna mill was timed to coincide with the annual visit of OTK's board of directors to the community. More than 400 people attended the opening, most of whom were brought in by a special train.

Prominent among the Finnish dignitaries who took part in the ceremonies were Alarik Mettala, M.Sc., technical manager at OTK, who formally presented a symbolic key to Dr. Uuno Takki, D.Comm. LL.D., general manager of OTK. Dr. Takki accepted the key on behalf of the Board of Administration and the Board of Directors of OTK, and then passed it to Emil Arro, production director of OTK, signifying that the Hameenlinna flour mill was formally in production.

Opening of the mill included a luncheon, at which time Mr. Robinson expressed the view that the Hameenlinna mill could only have been built with the closest cooperation of the miller and the milling engineer. Mr. Robinson also thanked the OTK officials for the praise given his firm for its part in the construction.

The whole background of the Hameenlinna project was given concisely and in detail in speeches made at the ceremony by Mr. Mettala and Dr. Takki.

In his speech Mr. Mettala said:

"For some time the capacity of the Helsinki mill has been inadequate to meet the growing demand for flour from our member societies. The ingenious alteration and rearrangement of existing machinery undertaken have resulted in an increase in the output of some 20%, but, nevertheless, in time it would still only have been possible for OTK to supply half the demand for flour placed upon it.

Production Problem

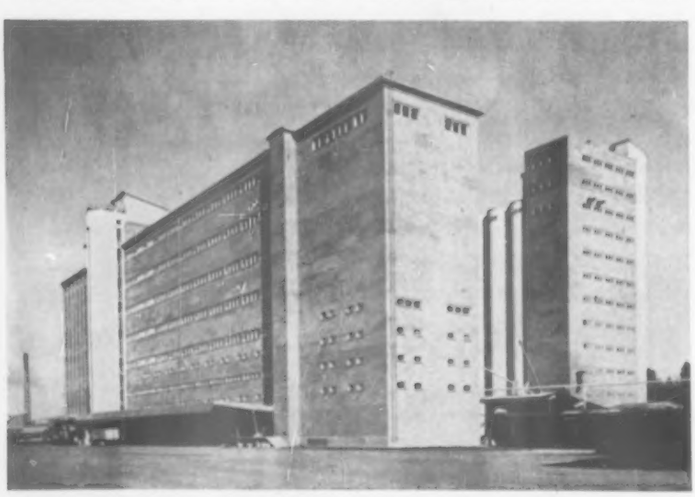
"At the same time the recurrent problem of the manufacture of bread within our co-operative movement was again pertinent. The largest bakery within the progressive co-operative movement was that of the Osuusliike Elanto. But, as demand continued to increase, it would have been necessary for Elanto to expand its existing bakery and to completely renovate it. It was the opinion of Elanto's board that the manufacture of those kinds of bread, like hard bread, that can be kept for some time, should be included in the items produced by OTK, which is the central production organization of this co-operative movement. It was only the force of circumstances prevailing many years ago that led Elanto to first undertake production of such bread.

"This gave rise at first to the idea and later to the actual planning of an OTK bakery. It was evident that the factory should be situated near the mill so that flour could be conveyed through pipes direct to the bins in the bakery, without it being packed first, in the same way as waste materials are being transferred from the mill to the provender plant. The fact is that the cost of packing in sacks alone is one mark per each kilo of flour. As the district Lahti-Helsinki-Turku-Hameenlinna, with its dense population, would be a large consumer of bread, calculations made in connection with the planning of the bakery were weighed in favor of placing the mill near the consumption centers. As OTK already possessed an industrial estate and had planned a housing estate at Hameenlinna, and as we have always been on very good terms with its people, it is quite natural that the choice should have fallen on Hameenlinna.

"Consequently, in the winter of 1954, the technical department of OTK was entrusted with the task of building a mill there.

"Suitable ground was found next to the site that OTK already owned. The ground was rather good, a railway line could be run in, and the future of road communications was promising. This area of approximately 20 hectares (5 acres) was bought, and OTK was ready to start on definite plans. As a result, a number of factories will be grouped around the same railway network. These will include a mill, a provender plant, a bak-

(Continued on page 21a)



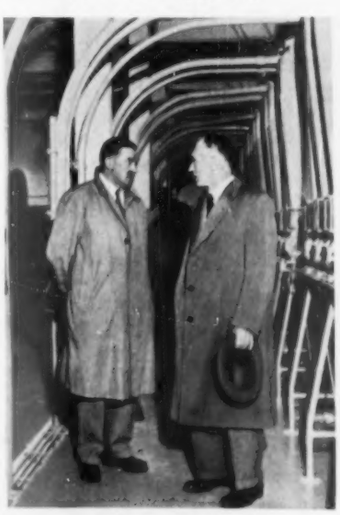
"Flour for the people of Finland"

This is a picture of the Hameenlinna flour mill which was constructed by OTK and opened recently. The mill is on land which comprises about 5 acres of ground close to a power station and railroad facilities. The power station, too, is owned by the Finnish cooperative.

Mr. Mettala Dr. Pulkki Dr. Takki

"A difficult task has been completed"

The three men pictured above figured prominently in the project which resulted recently in opening of a new flour mill at Hameenlinna, Finland. All are leaders in OTK, the Finnish co-operative society which owns and operates the mill. Mr. Mettala is technical manager for OTK. Mr. Pulkki, a biochemist, is manager of the mill, and Dr. Takki is general manager.



"A fine job"

Pictured above inside the Hameenlinna flour mill which their company constructed are D. W. Povey and F. G. Boon, of Thomas Robinson & Son, Ltd., Rochdale, England. Mr. Povey is technical executive for Robinson and Mr. Boon is chief erector.

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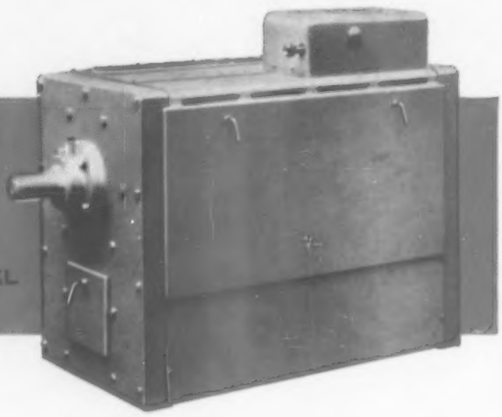

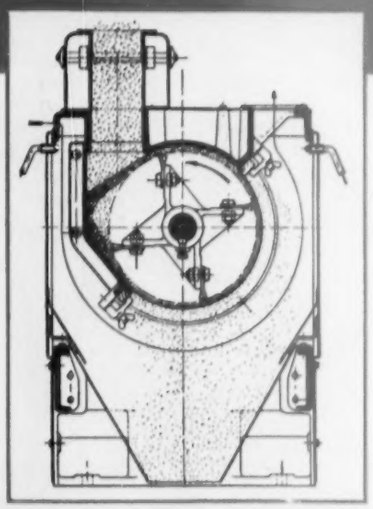

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Mechanization and Automation of Processes In the Milling and Baking Industries

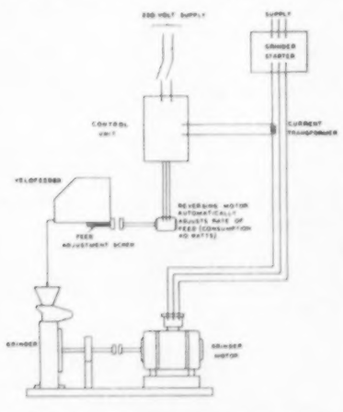
By David G. Elias

EDITOR'S NOTE: Mr. Elias is head of the chemistry section of Henry Simon, Ltd., the British milling engineering firm. This article is taken from a talk he delivered at Detmold, Germany.

It is probable that the recent upsurge of interest in the subject of automation is due to the greatly increased rate at which automatic processes have been applied to industry in the last few years—an acceleration which has been entailed by increasing demand for the end products of industry, by the steadily increasing cost of human labor and its lack of availability in certain areas, and by the growing and more competitive nature of the markets.

The application of automatic processing brings at one and the same time a simplification and a complication to those industries to which it is applied, and very careful planning is therefore entailed if automation is to produce the most satisfactory results. If product markets are likely to change in character, then the system must be flexible enough to allow this need to be realized; adequate safeguards of product quality must be built into the system. Perhaps most important of all, the effect of automation on human relations within the industry concerned requires extremely careful thought and study.

These considerations are of a general nature and in a number of industries where mechanical processing has been applied gradually over long periods of time, the right answers to these problems have already been found. Such a case is surely offered by the flour milling industry since the introduction of the roller milling system in the latter half of the nineteenth century, and even today there must be few cases, apart from the oil and water supply undertakings, where larger tonnages of material are produced by smaller labor forces.



SCHEMATIC DIAGRAM OF AUTOMATIC GRINDER FEED CONTROL INCORPORATING A VELOFEEDER

Figure 1

ELECTRICAL CONTROL—For economic operation it is essential that the feed to a grinder should be constant at a predetermined value. This is insured by this arrangement in which the grinder motor current is made to operate the discharge rate of the vibrating feeder which serves the grinder.

At this point it would perhaps be advisable to endeavor to draw a distinction between the words "automation" and "mechanization," and between the "automated" and the "automatic" processes. As a very rough guide it can perhaps be said that "mechanization" refers solely to the replacement of human muscle power by mechanical devices, whereas "automation" entails a certain amount of "thinking" on the part of the machine. Thus a purely mechanical process still requires adequate control by an operator, while the supervision can be dispensed with to a greater or lesser degree in a fully or partially automated process.

Mechanization Achieved

In a relatively fixed process, such as the production of flour from wheat, a considerable degree of mechanization has been achieved by the design of a number of suitable machines and various methods of linking these machines into a continuous flow. It should be noted, however, that this is by no means a purely modern conception.

There is little need to elaborate on the present day flour milling system, which will be familiar to all of you, except perhaps to mention briefly a number of devices which have been incorporated into the system and are self-adjusting in their operation. For example, the self-balancing feed gate, a relatively simple mechanical device, has long formed an integral part of a particular operation, and this affords an excellent example of an entirely automatic device.

An electrical derivation of this idea is shown in Figure 1, and here the simple, but entirely satisfactory nature of the system is clearly shown.

There are many such devices in constant use in the cereal processing industry, but it is not the purpose of this article to discuss every one of these in detail.

Probably the first of two major changes which have taken place in flour milling technique has been the introduction of pneumatic methods of handling and conveying in place of mechanical methods. The manifold advantages of this system have been fully described elsewhere, but it is of interest to note that the new conveying medium has naturally brought fresh problems of automatic control to the fore, and many of these have now been solved by ingeniously designed devices such as the air-valve shown in Figure 2.

Led to Redesign

Pneumatic handling in place of mechanical handling has also led to the redesign of some conventional machinery, and this also is illustrated in Figure 3.

In all cases the main aim of the designers has been to render the processing more automatic, less liable to human error, and able to produce a product of better and more consistent quality than before.

It should perhaps be mentioned here that pneumatic handling plants can be classified into two distinct systems: Those in which stocks are moved by suction (as in many bulk intake and flour mill plants) and those in which the stocks are moved by blowing. Each class has certain advantages for specific applications, and the choice of class demands considerable study of the over-all requirements.

The second major change to take place in the industry was the mechanization of the product packing process.

For many years the largest concentration of labor in a flour mill was employed in the warehouse, and it was therefore a practical and logical step to bring in automatic processing at this point.

Development Rapid

The storage in bulk of the main flour mill products is by no means a new idea, but since the end of the war this process has been developed to a marked degree. It has enabled the miller to make use of high capacity packing machinery and thus arrange his warehouse labor on a more economical basis, and it has resulted in cleaner warehousing with correspondingly better control of infestation. Bulk storage by millers, of course, entails the bulk transport of material away from the mill, and bulk reception by the user for optimum efficiency, but such are the advantages of the bulk system that many installations have now been completed in Britain, and many more are envisaged. This is hardly surprising in view of the economies which result from the use of bulk storage in bakeries, for it has been shown that for a plant with a storage capacity and weekly usage of 250 tons of flour the total saving of the bulk system over the sack system in two years' running is more than $50,400.

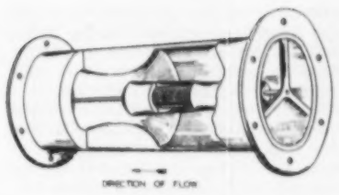


Figure 2

AUTOMATIC VALVE—This is a device for maintaining a flow rate of air in a pneumatic conveying line. If the flow rate tries to increase, the spring loaded plunger is pushed nearer the shaped opening, thus increasing the system resistance and reducing the flow. The absolute setting of the valve can be adjusted by altering the spring tension inside the plunger.

As might be expected, the handling of flour in bulk has also produced new machine requirements, and once again a number of devices has been produced to meet these needs.

In the bakeries themselves there has also been a trend towards the mechanization of the bread and biscuit baking processes, and it would be difficult to find a large or medium sized bakery today which does not use continuous traveling ovens and dough provers. Mixing of the dough, both for bread and biscuit manufacture, is still largely performed as a batch system, but it is probably safe to forecast that eventually the continuous dough mixer will take its rightful place here.

Automatic temperature control has

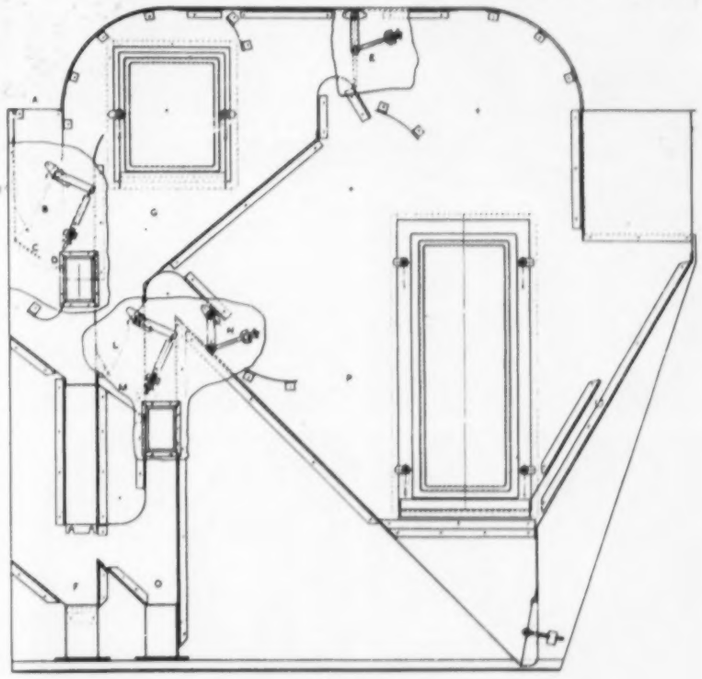


Figure 3

ASPIRATOR FOR WHEAT CLEANING—The grain feed enters at A and falls into the first aspirating leg via the balanced feed gate B and the fixed feed plate C. As the grain falls in a uniform curtain into the current of aspirating air the lifting operation can be observed through a small window and controlled by the air valve E. The clean wheat falls to the outlet F, while the lifted impurities plus a certain amount of small grains are dropped by the air in the settling chamber G. A second balanced feed gate then releases them into a second aspirating air stream, and this lifting operation can also be observed by a small window and accurately controlled by the air valve N. The lifted impurities then go to the settling chamber for disposal while the recovered wheat falls to the outlet O and returns to the feed.

also been applied for many years in the dough provers and baking ovens used in the baking industry, and indeed in conditioners and other machines in the milling industry.

This type of thermostatic control normally employed is so familiar today that it has tended to lose interest, but it was pointed out to me recently by a well-known bakery scientist that this really represents the first stage of automation in the baking process. An example of the second stage would be the use of an optical device to sense the crust color of loaves leaving an automatic oven and to adjust the temperature accordingly—but even this device would still be subject to the time lag wastage due to the number of loaves actually in the oven at the time the alteration in temperature was made. Thus the third stage wou'd be the introduction of sensing devices at a previous stage in the process to anticipate the change in crust color and to make the adjustment at the correct time.

Dough dividing has also been performed automatically for many years, generally by fairly simple volumetric machines, but the British legal requirement that loaves shall conform to certain specific weight values has led to the development of automatic weight limiters for the controls of these machines.

For the present, however, it is at the formulation stage that a change of system is occurring—particu'arly so in the manufacture of biscuits, where large numbers of ingredients are often involved with a correspondingly large amount of labor and time. The introduction of automatic proportioning here can therefore be rightly regarded as the major advance in many years. It might be useful at this stage then to consider such an installation in detail. A number of bins, each discharged by an electrically controlled feeder, have their outputs directed into a common weigh pan. Connected to this weigh pan is a scale head, the readings of which are transmitted electrically to a control panel. This panel contains a number of controls which can be pre-set to the desired quantities of the various materials in the bins, and the system is so arranged that on initiating the process the correct quantity of the material "A" is run into the pan followed by the correct quantity of the material "B," and so on. When all the ingredients have been added the weigh pan discharges the mixture automatically to the next part of the process and then repeats the operation as often as is desired.

Many Uses

The scale head settings at which the various ingredients are caused to cease flowing are pre-set by the manual operation of an appropriate number of dials on the control panel, but even this operation can be performed automatically by the use of punched card mechanisms.

Furthermore, it is not only the formulation of the mixture which can be controlled in this manner, but also the routing of materials and the timing of the processes. Thus a complicated ingredient formula, an equally complicated processing system, and a required number of cycles of operation can be reduced to a number of holes in a piece of card which can then be used to initiate and control the entire process.

This formulating system is not confined to the biscuit trade, of course, and it is already finding wide application in the production of animal feedingstuffs, the manufacture of rubber goods, fertilizer production and many other industries. In the examples shown earlier, only batch process operation has been shown, but there would be little difficulty in applying systems of this type to continuous processes by the use of suitable weighing devices.

The introduction of automatic processes into the milling and baking industries has naturally accentuated the need for quality control of the products concerned, and hence considerable effort has been expended on this matter.

As far as the British flour miller is concerned, the main parameters of which he requires constant and accurate information are moisture content, gluten strength, particle size and last but by no means least, flour color and instruments and techniques to fill these needs have been devised.

It may also be necessary to embody automatic sampling into the system and the Mercier Automatic Sampler has been developed for this purpose.

Trend Summary

To sum up so far, therefore, present trends can be briefly summarized as follows:

Flour Milling: Pneumatic conveying; automatic sampling; bulk storage and delivery; better quality control.

Baking: Bulk intake; automatic proportioning; automatic process control.

It is always difficult, not to say dangerous, to prophesy future trends, but it can be inferred that, apart from the redesign of machinery, the next stage towards automation in flour milling is two-fold: first, the development of continuous methods of quality testing, and second the coupling of these methods by means of suitable servo-mechanisms to the process itself, so that true automatic control is acquired.

Let me quote a hypothetical case

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from outside the flour milling and baking industries. The end products of the animal feedstuffs industry in Britain have to conform to certain analytical standards of protein, fiber, carbohydrate, etc. These products may be produced from as many as 30 ingredients—the exact formulation depending on the chemical composition of the ingredients, their availability, the prevailing price and a number of other factors. The working out of a suitable formula is therefore a lengthy and complicated process—and already electronic computers have been employed to carry out this stage of the process. It does not require much imagination, therefore, to visualize the final stage of this process—the coupling of the computer to the automatic proportioning system and the process control—thus yielding the truly "automated" industry.

Organization Needed to Solve Technical Manpower Problem

By James O. Bengston
President, Chicago Apparatus Co.

The technical manpower problem, like many others, is more easily stated than solved.

There is a drastic shortage of scientists and special technicians, not only in your industry but in other business fields which compete against you for brainpower. For example, there were 11 pages of help wanted ads in a technical journal that was put on my desk one morning. Almost identical job openings were described by a corn processor, a textile manufacturer, a petroleum refiner, a plastics producer and several other manufacturers.

The main cause, of course, is the rapid expansion of industries which demand scientific research and technical skills. But, in addition, leading educators and industrial experts agree that many trained professional men are used ineffectively.

This is the problem we must solve. We can't afford to have scientists lose precious time because they are wrapped up in administrative details and procedures. We can't allow them to be slowed down by the need to spend a high percentage of their time outside their specialized fields.

How do we correct these situations? The executive in your industry would like to know. He must compete with many another business firm for men with Ph.D.'s and M.S.'s and bachelor's degrees in chemistry. And he's now paying 20 to 25% higher starting salaries to attract such workers than he did a few years ago. In fact, graduating Ph.D.'s in chemistry, with no previous work experience, have been hired by industry this year at an average starting salary of $600 a month.

Stretch Manpower

Facing such a hard economic fact, the executive must take full advantage of techniques that have been developed to stretch out creative manpower. Many of these are coming from the research laboratory, which is doing an excellent job in researching itself. If the rest of industry were as efficient as the laboratory, there might not be the existing shortage of technical manpower.

For example, many laboratories have adopted an organizational set-up similar to a hospital, which has administrative specialists for paperwork and business operations, freeing doctors to care for the patients.

In the case of a laboratory, the non-professional manager or administrator can take care of many details for which the technically-minded person has little aptitude and less enthusiasm. Purchasing reports, personnel administration, supplies requisitioning, and many other tasks are handled best by the non-professionals.

Let's look at it this way: No executive in his right mind would ask a Ph.D. in chemistry to take dictation—not if he wants his letters in the 5 o'clock mail. Yet some companies continue to saddle professionally trained people with other work that could be handled twice as fast by a competent secretary.

This situation is being corrected in some places. For example, chemical laboratories in 1950 employed an average of three supporting personnel, such as clerks and semi-skilled technicians, to four scientists. Today the ratio is almost five supporting personnel to four scientists. This provides virtually the same effect as increasing scientific manpower by 50%.

Specialization Problem

Another problem involves specialization and how far it can be carried practically. For example, there is a great deal of mathematics involved in some phases of scientific research, so some laboratories find it more efficient to employ special mathematicians. We must study the problem further.

In the first place, it will be difficult for fairly small companies to break down their need for technical skills into tight compartments. Obviously, not every company can employ one man to do nothing but microscopy, another to do mathematics, and so on. But it will pay executives to evaluate their special needs.

Particularly in the technical field, as distinguished from the scientific, do we find instances of highly skilled men spending a quarter to half their time on nonspecialized work. Some of this work could be compartmentalized and parcelled out to men in less highly paid and less critically scarce categories of technical fields.

Executives should also consider new instruments which help scientists and technicians do a better job faster. Electronic computers, the so-called "magic brains," are an outstanding example.

A botanist friend of mine recently learned the value of such instruments the hard way. Studying the effect of hormones on the distribution of nutrients in plants, he had to grow, harvest, dissect, and weigh hundreds of plants.

This gave him his raw data, but it was virtually meaningless until he performed thousands of mathematical computations. Using a simple electric calculator, he took seven weeks to obtain his complete analysis. And all his mathematics could have been done in two or three days on an electronic computer, allowing for the time to program the machine and the few minutes for the actual computations.

Few companies, of course, can afford a computer on a fulltime basis. However, their usefulness has been so well established that several centers have been set up to make computers available on a special project basis.

Many other scientific instruments have been equally as important in stretching out creative brainpower. Actually, there is proof that the laboratory has been automatized far faster than the factory. Annual sales of scientific instruments have increased 62% since 1950.

In addition, instruments themselves are being made so much more efficient and automatic that they save more and more creative manpower. There are improvements like the recording spectrophotometer, which not only analyzes the content of materials quickly and accurately, but records all its findings. It is many times faster than a manually operated spectrophotometer.

Such increases in efficiency often are overlooked in discussions of the scientific manpower shortage. While there is a definite cause of concern in the shortage of scientists, perhaps a bigger problem is getting the rest of industry to catch up with the laboratory.

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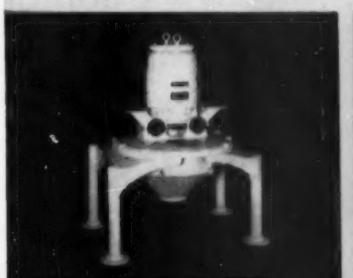
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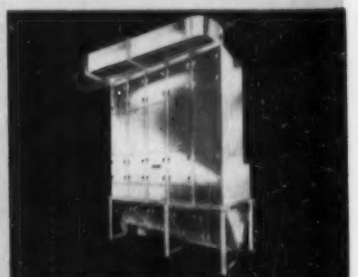
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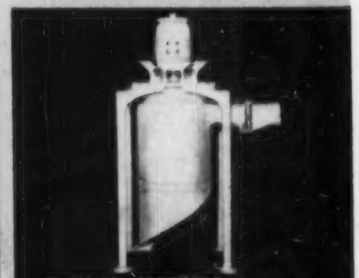
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2 New Newsletters To Cover Sanitation

LOUISVILLE, KY.—Two newsletters, one for top management and the other for supervisors of building and plant cleaning programs, will be published by Industrial Sanitation Counselors, Inc. Distribution will be made to 35,000 sanitation managers, supervisors, and company executives, and is expected to start very soon.

In announcing the new publications, Mohe H. Solworth, president of the consulting firm, said they are designed to demonstrate the value of cost control housekeeping programs and the place of such programs in industrial and institutional operations.

The "Executive Counselor" will appear bi-monthly for management and will emphasize new techniques and the proper selection and training of personnel.

"We will not waste the executive's time with minor details," Solworth said. "The newsletter will discuss only those broad principles of maintenance and cleaning which are of interest at the top level. A new method of mopping or wall washing would not be important as such. On the other hand, a system for training employees in new methods might save a company tens of thousands of dollars per year. That is what the executive wants to know and that is what we intend to tell him."

The "Supervisory Counselor" for administrators, superintendents, and foremen concerned with sanitation in factories, office buildings, hospitals, hotels, food plants, schools and other institutions, will be published monthly. It will feature news about man-saving cleaning methods, new products, equipment, books and articles. It will contain information on what the supervisor can do to improve his leadership and guidance abilities.

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The greater variety of screen sizes available in Columbia-Southern sodium bicarbonate enables you to blend your flours just right . . . exactly suited to your individual requirements.

Choose your screen from powdered, granular, or Flour Blend. Particle size for each type is uniform. If shelf life is a problem, you may find that the proper selection of sodium bicarbonate for your mix improves shelf life considerably.

Columbia-Southern "bicarb" is pure, white, free-flowing, smooth-blending. Order a supply today. You'll like it.

Toronto, Niagara Millers, Chemists Meet Together

TORONTO—Members of the Niagara Dist. No. 8, Association of Operative Millers, and the Toronto-Niagara sections of the American Association of Cereal Chemists attended a joint meeting recently in Toronto. The program was highlighted by discussions of the application of atomic energy to the food industry, skills and standards in flour mills, and the relationship of millers and bakers.

The meeting was opened with Carl C. Giltner, chairman of the Niagara district, AOM, and A. L. Klopp, chairman of the Toronto section, AACC, presiding. The welcome address from management was delivered by D. M. Hunter, president, T. H. Taylor Co., Ltd., Chatham, Ont.

D. A. Ross, president, Canada Bread Co., Ltd., spoke on the subject "A Bakery Operator—His Viewpoint." Mr. Ross put his emphasis on the necessity for millers to produce flour of constant quality, and the desirability of having millers and bakers cooperate more closely on problems of the production of flour and baked foods.

Dr. L. Voyvodic, director of nuclear projects for Isotope Products, Ltd., Oakville, Ont., spoke on "Atomic Energy in The Food Industry." Dr. Voyvodic used slides to give a clear, concise picture of the practical applications of atomic energy to the food industry.

For the afternoon sessions, the AOM and AACC divided into separate sections. After announcements were made and officers elected, Lyle Mertz, vice president, AOM, and Don Eber, executive secretary, AOM, discussed activities of their organization.

Roland Tobler, Tobler, Ernst and Traber, Inc., New York, gave an illustrated talk titled "Bolting Cloth." Mr. Tobler used slides to show the various compositions of nylon and silk available.

A talk on the standards of technical skill in flour mills was given by A. J. C. Willis, general superintendent, Ogilvie Flour Mills, Ltd., Montreal. Mr. Willis sketched a vivid comparison of the old-fashioned miller, with his depth of knowledge of the milling art, and his modern counterpart who is constantly busy checking temperature gauges, water gauges, ammeters and humidity controls. The latter, he went on, is always listening with a well-attuned ear to the innumerable high and low-level buzzes and alarms, all products of the "fiendish flour milling engineers."

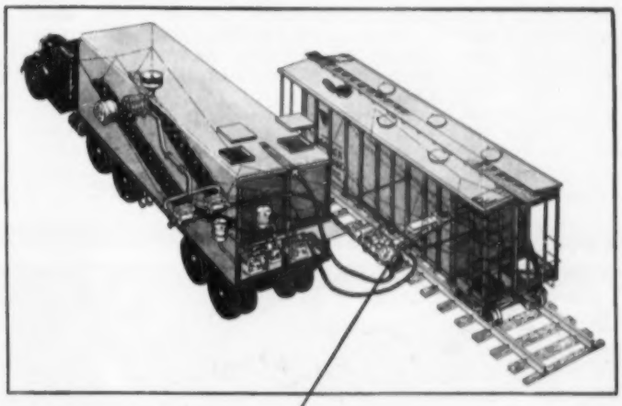
The concluding paper was given by Michael Fanning, Thomas Robinson & Son, Ltd., Rochdale, England, and was on the subject of "Starting a Pneumatic Mill."

As the final part of the meeting, members and their guests attended a cocktail party given through the courtesy of the allied trades. The meeting also included a banquet.

——BREAD IS THE STAFF OF LIFE——

St. Louis Club Holds Annual Dinner Dance

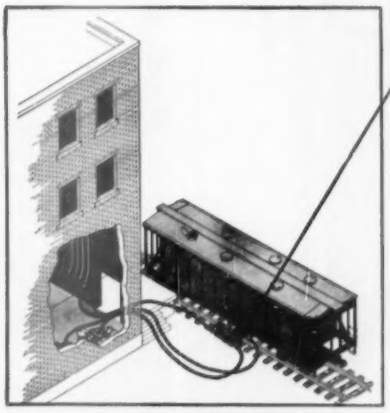
ST. LOUIS—More than 150 members of the St. Louis Milling & Grain Club and their wives attended the annual dinner dance at the Hotel Chase on the evening of Nov. 24. A number of guests went home with valuable door prizes.



Transferring flour from Airslide car to Airslide bulk flour van.

THE NEW FULLER AIRSLIDE® TRANSFER UNIT

Puts bulk flour in reach of EVERY baker



Transferring flour direct from Airslide car to storage in bakery.

No matter where your plant is located—on a railroad siding or a point distant from it, the Fuller Airslide Transfer Unit provides a sanitary, low-cost transference of bulk flour from General American Transportation Corporation's Airslide Car to Airslide bulk-flour vans or direct from car to plant storage bins.

This simply operated unit now makes it possible for every baker to take advantage of handling flour in bulk and enjoying its attendant benefits.

A compact combination of the Fuller-Huron Airslide and the Airveyor®, this portable unit fluidizes flour for conveying into your plant storage or into bulk flour vans, for delivery to your bakery. Well-balanced and easily handled by one man, it can be raised and lowered automatically to match the outlet level of the Airslide car.

The advantages of flour in bulk are now—through the Fuller Airslide Transfer Unit—at your doorstep. To get the complete details of the Fuller Airslide Transfer Unit send for Bulletin TU-1, *wherever your plant is located.*

Visit Our Booth 1664, Plant Maintenance Show, Cleveland, Jan. 28-31

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Scholarships Offered In Food Technology

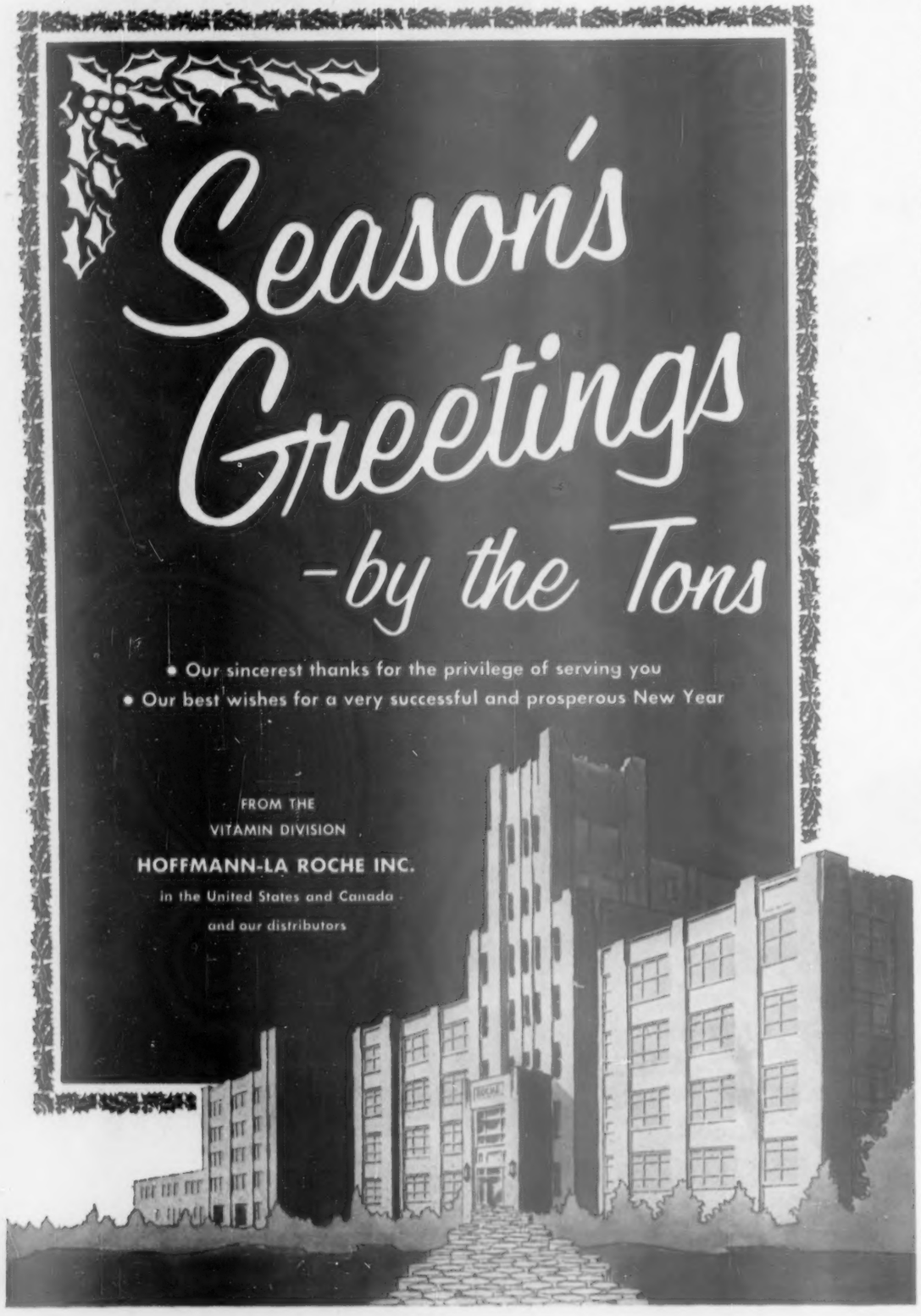
CHICAGO—The great interest of the food industry in encouraging advanced training in the food sciences is concretely evidenced in the 10 scholarship awards being offered in 1957 to eligible undergraduates and graduates studying in this field. Both prestige and money will come to the 10 winning candidates.

The General Foods Fund, Inc., is offering three awards, valued at $4,000 each per year. The Gerber Baby Foods Fellowships, six in number, are to be given to qualified food technology students in their last two years of undergraduate training. Each fellowship is in the amount of $1,000. The Florasynth Fellowship, also for $1,000, offered each year to an outstanding undergraduate or graduate in the food sciences, constitutes the tenth award.

Selection of the winning candidates is made by the awards committee of the institute of Food Technologists at Chicago.

The winners of previous years have hailed from widely different regions of the U.S. The Massachusettes Institute of Technology in Cambridge, the University of Wisconsin at Madison, Oregon State College at Corvallis, the University of California at Davis, are among the institutions represented. One winner of previous awards is a Canadian and another was from Australia.

Training and talent in food research and technology were never more in demand, and the scholarship awards are one indicator of the industry attitude. The Institute of Food Technologists has long been active in calling to the attention of high school and college students the many rich opportunities in the food industry for the professionally trained.


Season's Greetings
-by the Tons
• Our sincerest thanks for the privilege of serving you
• Our best wishes for a very successful and prosperous New Year
FROM THE
VITAMIN DIVISION
HOFFMANN-LA ROCHE INC.
in the United States and Canada
and our distributors

Essential Amino Acid Produced on Commercial Scale

The first commercial fermentation production of lysine, one of the eight amino acids considered essential to human nutrition, was announced by Chas. Pfizer & Co., Inc., Brooklyn, N.Y.

The development, representing a significant breakthrough in biochemical engineering, was made possible by the fermentation techniques which also help manufacture vitamins, antibiotics, hormones and other chemicals. These new techniques produce a high purity product free of D-lysine, a form of the nutrient which cannot be used by the body, the firm states.

Pfizer's chemical sales division will market the essential amino acid in the form of L-Lysine Monohydrochloride. Lysine is one of eight amino acids which cannot be synthesized by the body in amounts adequate to maintain tissue-building and good health.

The tissue building properties of L-lysine, according to Paul E. Weber, sales manager, "can potentially fulfill an important function in pharmaceutical dietary supplements designed to meet nutritional demands during all periods of life, from infancy to old-age. These include pediatric, geriatric, prenatal and other formulations."

"In the U.S.," Mr. Weber said, "approximately one fifth of the protein intake is obtained from cereals. But wheat and other cereal grains are naturally deficient in lysine. The addition of sufficient supplementary lysine, therefore, to give cereal grains a protein balance similar to meat and fish would appear to be a method of improving the general efficiency of the American diet, and extensive research is currently underway in this area."

—BREAD IS THE STAFF OF LIFE—

St. Regis Paper Opens Adhesives Testing Center

NEW YORK—The St. Regis Paper Co. has established an adhesives laboratory at the Kraft Center, Pensacola, Fla., for the development, manufacture and quality control testing of all St. Regis bag factory adhesives in the U.S., Puerto Rico and Canada.

Plans also call for the laboratory to furnish formulations, test reports and technical advice to the company's licensees, and to maintain continuous adhesive research and development program.

St. Regis converts an average of 250,000 lb. dry products into more than 100,000 gal. finished adhesives each month.

Because of the variety of bag equipment at Pensacola, it is possible to conduct pilot trials with adhesives which will be used on bag equipment at other plants. These trials can be conducted before substantial amounts of materials are shipped to other plants for extended trials.

Actual testing of adhesives includes checks on the binding time, water resistance, viscosity, solids, pH value and color. Checks are also made on the acid and heat resistance on pasted portions of all bag samples submitted.

Frederick W. Baldt

Firms Exchange Directors in "Moral Merger"

Walter W. Weismann, president of the Graton and Knight Co., of Worcester, Mass., announced that Frederick W. Baldt has been elected a director. Mr. Baldt is president and a director of the L. H. Shingle Co., Camden, N.J.

Lester H. Shingle, chairman of the board of the L. H. Shingle Co., simultaneously announced that Walter W. Weismann has been elected a director of his company.

The L. H. Shingle Co. and Graton and Knight are both leading producers of industrial leather products.

In a joint statement, Mr. Shingle and Mr. Weismann emphasized that both companies are maintaining their identities in all respects and will continue to work independently. The election of directors to each other's companies, even though Graton and Knight and the L. H. Shingle Co. are competitors, was brought about to improve operations through and by the exchange of information and knowledge of each other's operations, thereby increasing their efficiency which may be of benefit to the entire industry.

Though there is no financial merger of the two companies, Mr. Weismann and Mr. Shingle called their move a "moral merger" which will help augment sales of their own companies and through this "community of interest" will materially benefit the entire industrial leather field which in some respects has been losing ground in recent years.

Mr. Weismann is also chairman of the Aetna Industrial Corp., New York, an owning and operating company in various fields including rubber, lumber, clothing and fabrics. Aetna recently acquired Graton & Knight.

Walter W. Weismann

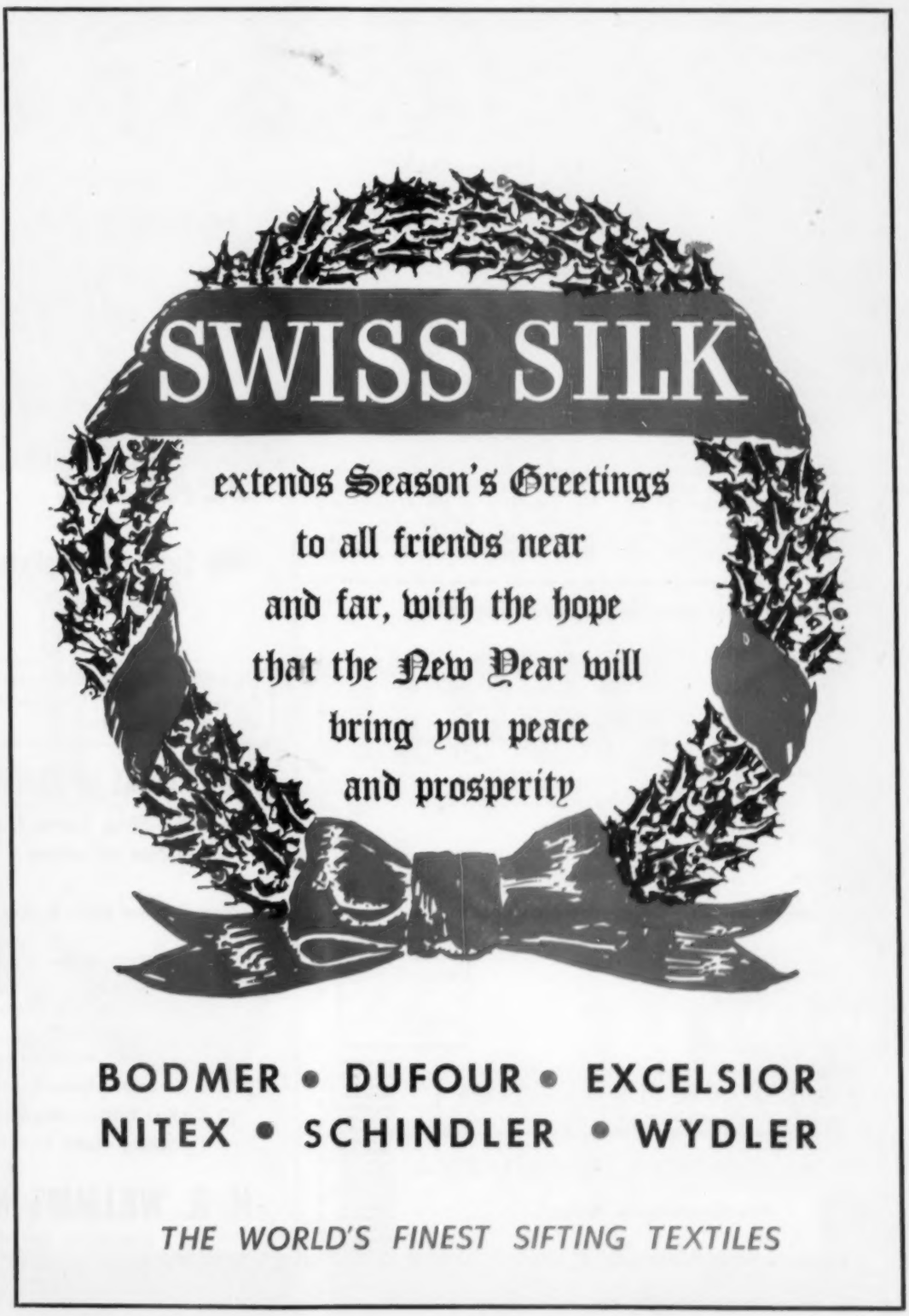
—BREAD IS THE STAFF OF LIFE—

Flour Quality Topic

MINNEAPOLIS — The characteristics and qualities of flour were discussed by Nick Moen, General Mills, Inc., at the November meeting of the Northwestern Production Men's Club in Minneapolis. Mr. Moen explained why the gluten content of flour must be high in both quality and quantity.

Frank Wichser, Pillsbury Mills, Inc., told members about the new crop flour, and said that there is not much change from last year's flour.

A question and answer period followed, with Mr. Moen, Mr. Wichser, James Conn of International Milling Co., and Fred Schmalz of King Midas Flour Mills comprising the panel. The moderator for the evening was Rudy Harder, Dunwoody Industrial Institute.



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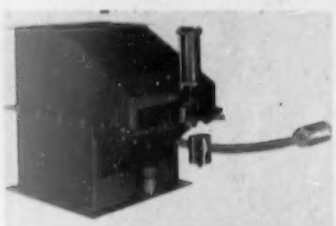
This reader service department announces the development of new and improved products, new services and new literature offered by manufacturers and suppliers. Claims made in this department are those of the firm concerned. Use the accompanying coupon to obtain the desired information.

No. 4059—Feeder

A new self-powered feeder used to control the feed of dry, free flowing materials at rates from 200 to 2,000 lb. per minute has been introduced by Wallace & Tiernan Inc. Other units are available to control feeds down to 5 lb. per minute over a 10 to 1 operating range. The feeders operate on the principle of balanced weights. The force produced by the



material being fed as it falls onto an impact pan, is balanced by a preset counterweight. The units are available with automatic shut-off to permit starting or stopping of the feeder, or synchronization with other plant equipment. No electrical connections are needed unless automatic shut-off is used. The units are adapted for use as semi-portable feeders. To secure more complete information check No. 4059 on the coupon and mail it to this publication.

No. 4062—Single Roll Crusher

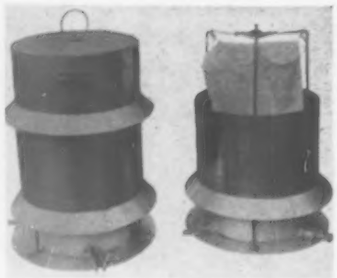
The standard model 104 single roll crusher made by Sprout, Waldron & Co., Inc., has been designed with a slide gate which can be adjusted to control the particle size of the product being discharged from the unit after crushing. It has been in use for years in the milling industry as a pre-crusher and control feeding of materials ahead of grinding mills, according to company officials. A variation of this model 104 covers basically the same unit machine but with one new innovation, the introduction of a stationary screen in place of the standard gate. This use of a screen greatly increases the versatility of the single roll crusher, it is claimed. The screen also produces a finer particle size. Many different screens are available and can be constructed of varied materials. These screens may be of perforated sheet steel with holes up to 1½ in. in diameter. Wire screens are also used. Some screens have been as fine as 10 mesh and have had a backing grid attached to them for additional strength. For more complete details check No. 4062 on the coupon and mail it to this publication.

No. 4060—Motor Selector

A new 12-page motor selector guide, published by the Reliance Electric and Engineering Co., gives information on how to select a-c. motors for specific applications. Included in the new booklet, bulletin B-2103-1, are such selection data as speed-frequency relationship, NEMA design classes, torque characteristics, NEMA current and torque values, frame selection tables and dimension charts and mechanical modifications for all frame sizes from 182 to 6085. Check No. 4060 on the coupon and mail it to secure more complete details.

No. 4061—Breather Unit

A weather-protected nylon breather unit for venting Airslide cars, Truck-A-Bins, and other bulk flour



transports is announced by the Fuller Co. When attached to the hatch of a car, van or truck, the breather permits air to enter the transport during pneumatic unloading and vents the air during the loading operation. The breather consists of a nylon sock suspended inside a 1-ft., 9-in. diameter frame. The sock is clamped at the bottom to a flange that rests on the hatch. In operation, the flange replaces the hatch cover of the vehicle and is clamped securely to the opening using the existing hatch clamps. The fine weave in the nylon sock retains flour dust and prevents it from being discharged into the atmosphere and prevents the entry of dust and insects, it is claimed. Operation in all kinds of weather is possible, the company

(Continued on page 15a)

Send me information on the items marked:

- ☐ No. 4059—Feeder
- ☐ No. 4060—Motor Selector
- ☐ No. 4061—Breather Unit
- ☐ No. 4062—Single Roll Crusher
- ☐ No. 4063—Research Bulletin
- ☐ No. 4064—Wire Screens
- ☐ No. 5596—Fire Detection System

Others (list numbers) .....

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all the facts uncovered by
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for 59 Years

LEARN

what the Southern Housewife thinks about home baking
...how much of it she does
and just why she loves to bake

Ask your V-90 salesman for a copy of Futures

She Loves to Bake

The great majority of the southern housewives like to bake—or, as many of them put it, "just love to bake."

The reason for this enthusiasm, the true motivation, is the immediate personal rewards that it brings. It is the expression of praise and appreciation from her family and her own feeling of satisfaction in fulfilling her role as homemaker and good cook.

The one woman in eight who "dislikes" baking falls in the lower economic group. She actually bakes on the average of twice a day, compared to the over-all average of ten a week.

Together, the enthusiastic baker and the industrious baker create a tremendous home baking market. The average southern housewife bakes on the average of 520 times a year!

how your own brand promotion
can be built around 5 strong appeals
aimed at the true desires
and motivations
of the Southern Housewife

Ask your V-90 salesman for a copy of Futures

Powerful appeals...Strong motivations

These are the appeals that have strong motivational value—
they are the things the housewife wants to hear:

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2 The promise of consistently successful and convenient baking

3 The advantages of multiple use

and the twin appeals:

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5 Low in calories

get your copy of **Futures** today

READ the complete, factual story on your customers...

LEARN what she says, feels and does about baking...

SEE how you can promote your self-rising products...in **Futures**

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states. Check No. 4061 on the coupon to secure more details.

No. 4063—Research Bulletin

Facilities of the central research laboratories of Allis-Chalmers Manufacturing Co. are described and portrayed in digest form in a new 24-page bulletin released by the company. Covered are facilities involving electrical, mechanical, physics, nuclear, chemical, metallurgical, and processing research projects initiated to bring to the company's product and design engineers new methods and processes that will help them in the development of new and better products. A copy of the bulletin may be obtained by checking No. 4063 on the coupon and mailing it to this publication.

No. 4064—Wire Screens

The Cleveland Wire Cloth & Manufacturing Co. has prepared a new two-color illustrated folder which combines a brief history of the company with partial cataloging of the most popular wire screen items. The folder is entitled, "Quality Wire Screen," and may be obtained by checking No. 4064 on the coupon and mailing it to this publication.

No. 5596—Fire Detection System

Details of the new Secoalarm fire detection system, designed principally for elevator legs and cupola protection in country elevators, feed and seed houses, have been announced by the Seedburo Equipment Co. The system is recognized by the Mill Mutual Fire Prevention Bureau when properly installed and maintained. Seedburo officials state. Each Fenwall Detect-a-Fire thermostat affords protection for a ceiling area of about 500 sq. ft., company officials say. Only one thermostat is required for each leg. The function of the thermostat is to complete an electrical alarm circuit, thereby sounding a specially designed Federal RX siren, claimed to have an audibility range of approximately one fourth mile. Literature on the system quotes specifications of the component parts and their costs. Secure the literature by checking No. 5596 on the coupon and dropping it in the mail.

Also Available

The following new products have been described in previous issues and information about them may still be obtained by jotting the appropriate number on the coupon and forwarding it to this magazine.

No. 3907—Plastic basket for packaging baked foods, Gilbert Plastics, Inc.

No. 3909—Wire stitcher, Ordnance Gauge Co.

No. 3910—Dry sweet whey, Consolidated Products Co.

No. 3911—Baking pan catalog, Chicago Metallic Manufacturing Co.

No. 3912—Aluminum foil pan press, Basca Manufacturing Co.

No. 3913—Mold and yeast growth inhibitor, Chas. Pfizer & Co., Inc.

No. 3914—Batter depositing machine, Filler Machine Co.

No. 3917—Aluminum foil pan and container price list, Chicago Metallic Manufacturing Co.

No. 3915—Pan greaser, Mallet & Co.

No. 3916—Revolving tray ovens, Middleby-Marshall Oven Co.

No. 3918—Display fixtures, Maine Manufacturing Co.

No. 3920—Dry sweet whey characteristics, Consolidate Products Co.

No. 3919—Aluminum food containers, Foil Kraft Division, Kaiser Aluminum & Chemical Corp.

No. 3921—Bakery equipment brochure, Petersen Oven Co.

No. 3922—Combination freezer-refrigerator, Victory Metal Manufacturing Corp.

No. 3923—Line of kettles, Hamilton Copper & Brass Works.

No. 3924—Bakery "filler" fixtures, Maine Manufacturing Co.

No. 3925—Aluminum bun pans, Harlow C. Stahl Co.

No. 3926—Dough sheet thickness control, Industrial Gauges.

No. 3927—New package for sweet dough base, Caravan Products Co., Inc.

No. 3928—Line of fillings and meringues, Max Ams Co.

No. 3929—Flavoring products catalog, Florasynth Laboratories, Inc.

No. 3930—Doughnut maker, Golden Joy Corp.

No. 3931—Pressure sensitive tape, Connecticut Hard Rubber Co.

No. 3932—Almond and lemon flavors for baked foods, S. Gumpert Co., Inc.

No. 3933—Bakery display fixture catalog, Maine Manufacturing Co.

No. 3934—Gravity wheel storage rack, M-H Standard Corp.

No. 3935—Moulder-panner, Read Standard Corp., Bakery-Chemical Division.

No. 3936—Mold inhibitor, Food Industries Co., Inc.

No. 3937—Display pans, Molded Fiber Glass Tray Co.

No. 3938—Oven bulletin, Petersen Oven Co.

No. 3939—Roll slicer, Alto Corp.

No. 3940—Self-adhesive labels, Avery Adhesive Label Corp.

No. 3941—Icing and filling depositor, Mallet & Co., Inc.

No. 3942—Vacuum and floor maintenance equipment, Premier Co.

No. 3943—Bakery pad, Panhandler Division, Sanitary Bag Co.

No. 3944—Rib-foil aluminum cups, Basca Manufacturing Co.

No. 3945—White milo starches for fruit pie fillings, Corn Products Sales Co.

No. 3946—Paste for macaroons and macaroon-filled cakes and candies, Henry Heide, Inc.

No. 3947—Revolving display unit, Vue-More Corp.

No. 3948—Repair of food handling equipment, American Solder & Flux Co.

No. 3949—Sterile conditioning system for liquid sugar tanks, D. William Fuller Co.

No. 3950—Packaging booklet, Hinde & Dauch.

No. 3951—Icing product, S. Gumpert Co., Inc.

No. 3952—Price information and details of route selling book, Mycroft Press.

No. 3953—Band edge sharpener, Gopher Grinders, Inc.

No. 5508—Embezzlement controls, Fidelity & Deposit Co.

No. 5527—Vacuum cleaner, Burrows Equipment Co.

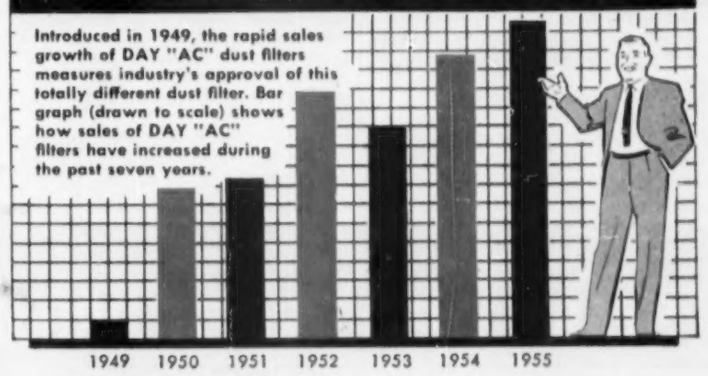
No. 5519—Insecticide for use around foodstuffs, J. I. Holcomb Manufacturing Co., Inc.

—BREAD IS THE STAFF OF LIFE—

MEXICAN WHEAT

Mexico is to make experimental plantings of "Lee" wheat, a variety developed at the University of Minnesota. This irradiated wheat has shown resistance to plant diseases encountered in Mexico.

DAY REVERSE JET DUST FILTERS
HAVE EARNED INDUSTRY'S ACCEPTANCE


Introduced in 1949, the rapid sales growth of DAY "AC" dust filters measures industry's approval of this totally different dust filter. Bar graph (drawn to scale) shows how sales of DAY "AC" filters have increased during the past seven years.
1949
1950
1951
1952
1953
1954
1955

HERE'S WHY **DAY Reverse Jet Dust Filters HAVE EARNED ACCEPTANCE!**

Utilizing the Hersey principle of reverse air cleaning, DAY "AC" dust filters offered industry a needed, long overdue, improved dust filter. This filter has many benefits never before found in any dust filter equipment.

● NEW HIGH EFFICIENCY PERFORMANCE—This filter provides efficiencies measured as high as 99.99+%. This assures cleaner air and higher product recovery.

● NEW FILTER MEDIA—DAY *felted* filter media traps more dust than woven fabric. Felt gives higher efficiency, longer life and has same pressure drop as woven fabric.

● NEW DESIGN FEATURES—The Hersey principle of reverse jet cleaning, DAY self-adjusting blow rings, sanitary square-to-round air inlets, automatic-continuous operation, superior filter media, are just a few of the features introduced by DAY.

● NEW FILTER TUBE CLEANING—Patented self-adjusting blow rings clean the entire filter tube automatically and continuously, to give DAY filters an air handling capacity 5 times higher than ordinary filters.

● NEW LOW INSTALLATION COSTS—Unit sub-assembly saves time and money—up to 75% on filter erection costs.

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The DAY "AC" Reverse Jet Dust Filter is the largest selling filter of its type in the world!

Place the successful operation of your dust control system in our hands. Experienced DAY Application Engineers will survey your plant and supply you with engineered recommendations. With DAY there is no divided responsibility. Our guarantee of satisfaction is backed by 75 years of experience.

Bulletin 559 gives important facts and complete description of the DAY "AC" dust filter. Write toDAY for your copy of this informative 24-page bulletin.

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The Chatfield & Woods Sack Co.
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SUPERIOR CARBIDE TOOLS
For All Roll Corrugating
Economical Increased Output
CORRALLOY TOOL CO.
Minneapolis 7, Minn.

U.S. Army Ionizing Radiation Center Will Be Constructed at Stockton, Cal.

WASHINGTON — Sharpe General Depot at Stockton, Cal., has been chosen as the site for the U.S. Army Ionizing Radiation Center, according to a joint announcement by Wilber M. Brucker, secretary of the Army, and Lewis L. Strauss, chairman of the Atomic Energy Commission.

The experimental center will be built by the Army Corps of Engineers and will include a nuclear reactor which will be built by the AEC. The center's purpose will be to investigate the use of ionizing radiation in the preservation of food and to conduct other projects of interest to the Department of Defense. The Quartermaster Research and Development Command at Natick, Mass., will direct the operations of the center.

AEC will design and construct the reactor and related equipment at an estimated cost of $3 million. The reactor, which will be a source of intense gamma radiation for use in experiments with foods and other materials, will be of the water-moderated type with solid fuel elements. A preliminary design concept is now being completed for the commission by the Internuclear Co. of Clayton, Mo. The commission is considering 11 proposals made by industrial concerns for the engineering design, fabrication and construction of the reactor.

Other facilities of the center, costing an estimated $4,500,000, will include a high energy particle accelerator to be procured by the Quartermaster Corps, and offices, laboratories, and processing and storage areas which will be constructed by the Corps of Engineers according to specifications being developed by the Quartermaster Corps. These specifications will take account of the needs of the other technical services of the Army.

Initially the center will have as its primary mission the development of methods of utilizing ionizing radiation to preserve foods and to determine the economic feasibility of such a process. The processing area will be designed so that a large variety of products may be handled and so that major modifications in processing lines may be effected.

This aspect of the center's activities will be performed in conjunction with the Quartermaster Food and Container Institute, Chicago, which is conducting the over-all Quartermaster Corps research and development program in the field of radiation preservation of food. This program includes contracts with 16 universities as well as contracts with research institutes and industrial concerns located throughout the country. The food processed through the center will be used in part for support of these contracts.

The location of the center at Sharpe General Depot was determined by the Army on the basis of a detailed survey conducted by a joint DOD-AEC site selection review committee. Thet committee considered such factors as proximity to highway, rail and commercial air transportation, availability of meats and a variety of food crops with a relatively long production season, cost of construction, availability of labor and reactor safety requirements. The recommendations of the committee were reviewed by a group of industrialists appointed by the National Academy of Scientists.

It is expected that work will commence during this year and that the center will be in operation in 1958.

—BREAD IS THE STAFF OF LIFE—

Ireland Will Open Research Station For Wheat Study

Ireland will soon open a research station for the study of wheat and its use in the production of flour and bread. The station will be located at Glasnevin, Dublin, and will be operated in conjunction with the country's Institute for Industrial Research and Standards.

One of the station's main tasks will be to see if a palatable batch loaf of reasonable quality can be produced from Irish wheat. Among the subjects to be examined will be the standardization of methods to determine moisture in wheat, the study of methods and equipment used in the artificial drying of wheat, laboratory tests of samples of flour available to bakeries and the study of excessive enzymic activity.

The new research station follows the establishment of a committee to advise the minister for industry and commerce on the problems arising from the use of Irish wheat in the making of bread. The question of Irish wheat and the percentage extraction for flour has been under consideration by the minister for industry and commerce for about two years.

The government has promised a $14,000 grant for the new committee, which includes scientists, millers, confectioners, bakers and members of the department of agriculture.

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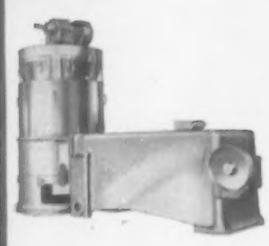

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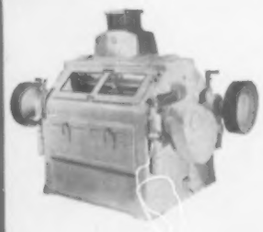

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Advantages of Cwt. Calculations Over Bu. Shown in Test Computations

Proponents of the plan to switch grain trading from the bushel to the hundredweight measure have provided a test sheet which they think proves the greater speed attainable in making calculations on the hundredweight basis.

The American Feed Manufacturers Assn's. committee of purchasing agents has been trying it on people engaged in the grain business. Some tests have shown that the hundredweight basis is almost twice as quick.

One experienced operator did the hundredweight computation, appearing below, in three minutes and took six minutes for the bushel extensions. A less experienced operator took five and 10 minutes respectively. Working by hand, another took eight minutes for the hundredweight test and 20 minutes for the bushel. Others took varying longer periods for bushels because of mathematical errors resulting from the complicated nature of the calculations.

GRAIN TRADING IN BUSHELS

Typical invoice extensions at Chicago. (Time your computations on all five and compare the elapsed time with your total on the cwt. basis.)

	Initial	Car. No.	Grade	Weight	Bushels	Price	Amount
Corn (Chicago basis freight collect and allowed)	UP	181119	1 Yel. Co. (57 lb.)	116,240	.....	1.54	.....
			Less freight from Capehart, Ind.			33.99 cwt.	.....
						Total	.....
Wheat (Delivered Chicago)	Truck		2 Red (59 lb.)	30160	.....	2.10	.....
						Total	.....
Oats (Chicago basis freight collect and allowed)	CBQ	18084	2 Hy Wh. (39 lb.)	87280	.....	.72	.....
			Less freight from Sullivan, Ill.			23.69 cwt.	.....
						Total	.....
Barley (F.o.b. Minneapolis)	GN	46910	2 Bly (46 lb.)	80000	.....	1.20	.....
			Less freight from Mpls. to Chicago			24.72 cwt.	.....
						Total	.....
Soybeans (Chicago basis freight collect and allowed)	NW	84420	2 Yel SB (59 lb.)	123500	.....	3.00	.....
			Less freight from Belshaw, Ind.			16.95 cwt.	.....
						Total	.....

GRAIN TRADING IN CWT.

Typical invoice extensions at Chicago. (Time your computations on all five and compare the elapsed time with your total on the bushel basis.)

	Initial	Car. No.	Grade	Weight	Price	Amount
Corn (Chicago basis freight collect and allowed)	UP	181119	1 Yel Co.	116240	2.75	.....
			Less freight from Capehart, Ind.		33.99 cwt.	.....
					Total	.....
Wheat (Delivered Chicago)	Truck		2 Red	30160	3.50	.....
					Total	.....
Oats (Chicago basis freight collect and allowed)	CBQ	18084	2 Hy Wh.	87280	2.25	.....
			Less freight from Sullivan, Ill.		23.69 cwt.	.....
					Total	.....
Barley (F.o.b. Minneapolis)	GN	46910	2 Bly	80000	2.50	.....
			Less freight from Mpls. to Chicago		24.72 cwt.	.....
					Total	.....
Soybeans (Chicago basis freight collect and allowed)	NW	84420	2 Yel SB	123500	5.00	.....
			Less freight from Belshaw, Ind., to Chicago		16.95 cwt.	.....
					Total	.....

Wheat Best Crop For Response to Fertilizer in Kansas

MANHATTAN, KANSAS—Wheat has responded more consistently and more profitably to applications of fertilizer under Kansas conditions than has any other crop, according to F. W. Smith of the Kansas State College department of agronomy.

"This has been true throughout the state, including the area of northeastern Kansas where wheat is less important," he said.

Use of only 25 lb. per acre of nitrogen plus necessary phosphate and potash could add an average of 9.5 bu. an acre to the yield of wheat. This has been true for a wide variety of conditions, including years of above average rainfall as well as years of below average rainfall.

In some instances, an increase of up to 50 lb. of nitrogen an acre will add another four bushels to the y'e'd of wheat. However, use of only 25 lb of nitrogen to the acre is widely practiced in the southern portion of the Great Plains where nitrogen deficiencies are not so marked, Mr. Smith said.

"Nitrogen is one of the most profitable fertilizers to use," Mr. Smith commented.

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(4) Hyperbolic sideboard ends permit greater load capacity without "slopping."

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✓ Dawson 73 is undiluted. It is sold at full strength. Percentage of active ingredients stated on label. Some fumigants do not state percentages. Watch your label. You get what you pay for.

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B For large mills, use "Little Squirt" applicator. Two men can fumigate average mill in two hours. Cuts costs substantially. No equipment to buy. No initial investment. Ask for details.

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Grain Sanitation Makes Great Strides During Last 8 Years

By LLOYD N. CASE

Those of us who have taken part in the clean grain program from the beginning can look back upon the significant progress made since 1948 when at French Lick, Ind., during the annual convention of the Grain and Feed Dealers National Assn., George Larrick, commissioner of the Food and Drug Administration, described the work that had been done with the mills and bakeries up to that time and over a period of several years. He said they had reached the end of the road so far as the millers and bakers were concerned, and no further improvement could be made in their products unless and until the raw material—wheat—was improved.

Therefore, Mr. Larrick said, the Food and Drug Administration was turning its attention to wheat and suggested the industry bend its efforts to improving its handling and storage practices. He placed much emphasis on the procedures he intended to follow: first, warning; second, limitations; third, tighter limitations. He promised the full cooperation of his agents. He and his assistants participated in meetings and elevator check lists were drawn up in full cooperation with people in the trade.

EDITOR'S NOTE: This article is taken from the address which Mr. Case, director of the Commodity Stabilization Service, delivered at the recent second National Grain Sanitation Conference at Kansas City.

Certainly there was resistance. "It was good enough for our grandfathers," "Nobody ever suffered," and a host of other statements were made. While Mr. Larrick gave assurances he intended to proceed slowly and he expected it would take a number of years to achieve his goal, there were grave doubts and many predictions of disaster. These dire predictions have not materialized.

Many Participate

Fortunately, when the active program actually got under way, everyone engaged in the marketing and distribution chain for wheat pitched in and faced up squarely to what had to be done. Calling the roll of those who did effective work to insure a cleaner supply of wheat would reveal a long and varied list of many groups and individuals in and out of the grain business. Trade associations sponsored educational campaigns, brought together slides, films and posters and held meetings throughout every state in the wheat belt. State extension service personnel participated at the very beginning, and more recently the federal extension service participated in bringing about an expansion and coordination of the states' efforts. The federal extension service now has a special committee for carrying on the work. This committee is most effective and keeps in close touch with others who are also concerned, as well as agencies outside of USDA such as the fish and wildlife service of the Department of Interior and, of course, the people in food and drug.

Not only have the grain trade organizations and the extension service participated, but other trade and farm groups also have participated. Recognition is due the researchers, the experimenters, the ASC personnel, the Millers National Federation, and especially the Association of Operative Millers who came out with the first comprehensive treatise on the subject. This treatise was and probably still is a sort of bible for those concerned with sanitation problems.

We have one man in the grain division of CSS who devotes most of his time "riding herd" on the overall grain sanitation problem. Among other things, he keeps a log on developments. At this time we have four or five large binders filled with "evidence" of efforts, and every week sees more material being put in them. Anyone who doubted the two-fisted participation of USDA in the fight for cleanliness would have to revise his thinking upon going through this record!

Farmer Key Figure

Everyone recognized early in the game that if a warehouseman did not receive clean grain from the farm, he could not ship clean grain. That problem soon resolved itself into the realization that it wasn't enough to have 99 out of 100 farmers delivering clean grain—there had to be 100, for one bad load could contaminate a whole bin of otherwise clean grain. The elevator people found themselves in a difficult position in many instances. Farmers, not

● At the check-out counter of a supermarket, a member of a research team asked a lady if she'd mind answering one question. She didn't mind.

"Why do you buy X brand of flour?"

"Well, white flour all seems pretty much the same today, but *this* brand clearly assures you that vitamins have been added. See, it tells you plainly on the package 'ENRICHED FLOUR' and lists the vitamins. We buy enriched bread and other foods with vitamins—so I say why not get that health advantage in the flour I use?"

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knowing about the clean grain program, were inclined to suspicion the elevatorman of another "city slicker" trick to beat down the price. Something had to be done. Food and drug was in no position to take action until the wheat actually moved in interstate trade.

At this point, without slighting the important part played by so many in the effort to insure clean grain in the market place, let us review some of the activities of USDA relating to the handling of wheat and particularly to the handling of farm-stored wheat under price support. As one of the means of making price support on wheat more effective, USDA for many years has been advocating increased storage facilities on farms to promote more orderly marketing. USDA has emphasized that what was needed was not just storage, but storage of a kind that would adequately protect grain against insect damage, grain deterioration and spoilage. The great upsurge in farm storage during recent years is evidence that some of this urging bore fruit. The educational agencies such as extension service, both national and state, vocational agriculture programs, and others, played a dominant role in this by making it part of their long time programs for providing farmers and others with adequate information on storage design and equipment.

When the possibility of more formalized action to insure clean grain became apparent a few years ago, USDA stepped up this aspect of its activity in the price support field. In cooperation with research agencies, experimental work was undertaken to check samples of farm-stored grain under price support loans in certain counties of the Northwest. Check lists were developed to make a quick survey of each granary used to store grain under price support. These lists were used by inspectors when examining farm storage for price support purposes. The field organizations, through the county ASC committees and the extension service, were urged to take advantage of every opportunity at general meetings and through mailings to keep drumming away at the problem. The experimental program for checking samples from farm-stored loans brought us valuable information on how to handle operations involved in the CCC take-over of grain in farm storage. The check list brought home to the inspectors and farmers the need for specific corrective measures on individual bins.

Groundwork Laid

When formal standards were established under the Food and Drug Administration, much groundwork had been laid as far as the price support operation was concerned. USDA immediately incorporated the food and drug standards on wheat in the price support operation. As one of the eligibility requirements for 1955 crop price support, wheat had to meet the standards prescribed. To inform farmers fully of USDA's intentions, a leaflet outlining the 1955-crop price support eligibility requirements with special emphasis on sanitation was placed in the hands of every producer participating in the program. Even though the sanitary standards came after the 1954-crop price support program, USDA decided not to reseal any 1954-crop wheat in the spring of 1955 unless it met standards.

Without exception, any farmer who stored wheat on the farm and obtained a price support loan on it became familiar with the sanitation standards and their application under the support program. Almost immediately, the problem was brought home to thousands of farmers throughout the wheat-producing areas. At the same time, information on construction of adequate storage, remodeling existing storage, and other needed safeguards was flowing from the many technical and educational agencies. Once farmers realized the need and the place they occupied in the picture, the battle was more than half won. During this same period, all of the commercial marketing channels were reviewing their facilities and tightening up their grain handling and storage operations.

Currently, research is being carried out by various agencies of government with a substantial portion of the costs in some instances, and the entire costs in others, being borne by the Commodity Credit Corp. Some of these experiments are under closely controlled conditions such as those at the experimental bin site at Watseka, Ill., and others under practical working conditions such as the protectants being applied to several million bushels of grain in bins and ships. Other means of fumigation are on trial and we continue to watch closely those that have been approved. We have a complete inspection system for both bins and ships and every lot of grain is examined at least monthly and if any suspicion arises, much more often. We have not adopted a holding policy on grain which is in danger of going out of condition or which shows evidence of losing condition. Immediate disposition is made of these lots. Those lots, from whatever source, that do not meet food

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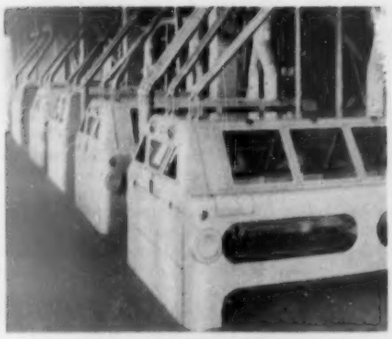

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(Above) The "Pneu-Roll" roller floor in the new O.T.K. plant Hameenlinna, Finland.

(Above Left) Type PSm square-sieve Plansifters—also in the new O.T.K. mill.

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NEW LABORATORY—Recently air conditioned and redecorated is this Kansas City grain inspection laboratory of the Kansas State Grain Inspection Department. The laboratory is equipped with all the precision apparatus needed for grain grading, and is one of the most modern in the country. J. L. Franklin is inspector-in-charge of the Kansas City operations. Donald C. Lunt is state director and J. A. McKone assistant.

and drug limitations are not disposed of for human food. They are diverted to animal feed immediately.

Standards Same

We have the counterpart of the bin inspector in our warehouse examiners working out of the several CSS commodity offices. When they inspect a warehouse operating under UGSA, they use approximately the same sanitation check list as that used by a food and drug inspector. Warehousemen seem to welcome this inspection and with very, very few exceptions, have quickly followed the recommendations of the warehouse inspector. While the threat of cancellation of the Uniform Grain Storage Agreement hangs over them, I do not know of a single instance where it has been necessary to exercise that authority.

The best opportunity for measuring the success of the undertaking for both farm and commercial storage came last summer when the Food and Drug Administration announced stricter sanitation requirements on wheat. While the industry had been forewarned and realized the necessity for this action, there was considerable apprehension as to the effect of the tighter requirements on the marketing machinery. It soon appeared, however, that great progress had been made because this action caused hardly a ripple, and the grain marketing system was undisturbed.

Much remains to be done. There is a lot we don't know about fumigants and residues and aeration and channeling or by-product effects. Parenthetically, one by-product effect we do know about is the reduction of fire hazards in elevators as a result of the widespread clean-up campaign, and another is the stopping of the unseen loss to farmers who have unknowingly lost millions of dollars in the value of their products to mice, rats and insects. This has not been stopped, but there has been great improvement.

Officials of USDA expect to assist in furthering of the programs now under way and to continue the policies which so far have kept losses to a minimum, yet have resulted in substantial improvement in the average quality of grain flowing into the processing plants. We will watch with interest developments involving grains other than wheat which go into human food. In the meantime, sensible and aggressive policies will be followed insuring the consuming public that all that can be done is being done to guarantee the best for their discriminating palates.

——BREAD IS THE STAFF OF LIFE——

Rodent Bombing

BERKELEY, CAL. — Cereal bait scattered by plane at a rate of one pound or less per acre prior to seeding effectively controls range rodents, according to an article in the current issue of "California Agriculture," monthly magazine published by the University of California containing reports of research by the experiment station.

Application of poisoned grain by any custom agricultural aircraft assures that the bait will be well scattered and, while effective in controlling small rodents, there is no danger of poisoning deer, sheep or cattle regardless of what rodenticide is used.

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FINLAND BUILDS

(Continued from page 1a)

ery, a macaroni factory, and probably some other factories later.

"Early in May, 1954, a start was made on the clearing of land. The work proceeded briskly, and the average rate of loading lorries was one a minute. Several tens-of-thousand cubic metres of earth were moved. From the power station in the area already owned by OTK a tunnel half a kilometre long and wide enough to permit a car to be driven through was built, along which water and sewage pipes and high and low tension power cables were drawn. Over two kilometres of railway tracks were laid.

"The mill was planned in close collaboration with the English milling engineers, Thomas Robinson & Son, Ltd., from whom the machines were ordered. Thus the machinery has determined the size and shape of the building, the heights of the floors, and many other points.

"Some of you may have wondered why both the mill and the provender plant consist of two parts. The idea is that all the departments to which goods arrive by rail are on the right-hand side of the in-coming railway line, while all the departments from which goods are sent out on the right-hand side of the outgoing railway line. Both parts are linked by tunnels passing beneath the railway lines. In the provender plant the actual factory and the store for raw materials are on one side of the railway line and the warehouse for finished products is on the other. In the mill the grain silo is on one side of the railway line and the actual mill and warehouse are on the other," concluded Mr. Mettala.

At this point Mr. Mettala introduced Dr. Takki and turned over to him the symbolic key.

Dr. Takki then spoke:

"The mill before us is actually the fourth bought by OTK. The first was purchased in 1923 at Jaaski. The second was finished in 1936, and OTK was fortunate in having the assistance, technical knowledge and enthusiasm of Dr. L. H. Pulkki, well-known biochemist. So, at that time, the new mill signified a great advancement in the country's milling industry. Furthermore, it performed a service to the country's economy by excluding the manufacture of coarse ground flour. The third mill was built at Jaaski before the war. But Jaaski belonged to territory surrendered to the Soviet Union in accordance with the peace treaty, and it is for that reason we gather here now to inaugurate a new flour mill.

"Milling can be considered one of the most important activities of OTK. It is our duty to serve consumers and to do our best to improve their conditions of life. In our efforts to achieve this end we must pay primary attention to the production of bread and its main ingredients. That is why the first central productive establishment of OTK was a flour mill. Now we have again addressed ourselves to the increase in production of our flour mills.

"But paradoxically: The more extensive and prosperous our cooperative movement becomes, the more it suffers from a lack of operating capital. As a firm's power increases so do the tasks it must undertake. A big enterprise is able to undertake a task which in the early stages of its activity seemed impossible. In spite of its 50 years of activity, our co-operative movement is under such pressure to expand that a parallel situation can be found only in the activity which took place at the end of the first decade of our century. Every populated district and every new expansion in the towns require its own co-operative shop.

"Before any decision about the erection of a new plant is made, the project is considered thoroughly and systematically by the administrative organs of OTK. Should 'this' or 'that' be the next plant to swallow a large part of capital which could so well be used for a thousand other purposes? In this case, a milliard Fmks was needed—was this the best possible way of using it?

A Heavy Burden

"When the answer is affirmative, it means that a heavy burden is laid on the shoulders of those who are going to perform the task. They have to use funds earned by hard work, and they must see that these funds are employed in the best possible way. In due course we will see the results, but my colleagues and I believe that in this case the funds have been used most profitably. There can hardly be a difference of opinion as to the necessity of this new flour mill. The proved technical knowledge, enthusiasm and interest of the planners, supervisors and those actually carrying out the work guarantee us a first-class technical performance.

"I have been very favorably impressed with all that I have seen of this plant, and I am sure that my good opinion of it will not change. I would like to take the opportunity to thank all the individuals, institutions and communities that have so meritoriously participated in bringing our flour mill to fruitful materialization.

"I particularly wish to express my gratitude to the foreign firm that supplied us the equipment. Mr. Robinson, Mr. Povey, and Mr. Boon—it is to you, as representatives of the firm Thomas Robinson & Son, that I want to express gratitude. Your world-wide experience, your wonderful technical knowledge and skill, all the advantages of your great organization have been placed at our disposal in the most generous way, may I say, according to the best tradition of English industry.

"I would like to express my gratitude to the manager of our two flour mills, Dr. L. H. Pulkki, D.Sc. Without his contribution this mill would not be what it is now; he has been the exacting intermediary between the constructors, the men on the machinery side and the men on the industry side.

"The entire planning of this industrial estate and the calculations involved have been drawn up in our technical department under the supervision of the chief engineer, Mr. Niilo Saramaa.

"I wish to express, also, the gratitude of our firm, our management and our administrative bodies to Mr. Mettala, our technical manager, who has not had a very thankful position as an intermediary between the demands of the management and those carrying out the work. It was on his shoulders that the final and heavy responsibility for the success of this building lay at the difficult moment of creation. It is to him that first thanks are due when looking at this very fine result.

"Let us all hope that this plant will bring our people the benefits, pleasure and blessing to which the expectations of this moment give rise," concluded Dr. Takki.

—BREAD IS THE STAFF OF LIFE—

TO BUILD ELEVATOR

FLORENCE, KANSAS — Stockholders of the Burns Farmers Union have voted to build a new 200,000 bu. grain elevator at Florence. The proposition was approved by a 2-1 margin at a special meeting. Estimated cost of the project is around $170,000.

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Here is a typical installation where this material is carried from the bin through a screw conveyor into the feeder. Air from the blower forces the product from the rotor pocket into the pipe line where it travels to its final collection point.

No matter how attritionized the product, this new Prater Blow-Thru Feeder will feed it efficiently and quickly into any pneumatic system. And this new design becomes an integrated part of the pipe line and will feed against pressures as high as 10 PSIG . . . either positive or negative!

One of the efficient design features of this unit is that on the horizontal center line of the body casing is a pressure neutralizing port to bring the rotor pockets to atmospheric pressure before filling.

There are many other interesting and high quality production features. Power requirements vary according to the fineness and abrasiveness of the product . . . flour, salt, carbon or any other material.

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Toronto Firm Installs Elevator To Ship Grain Loading System

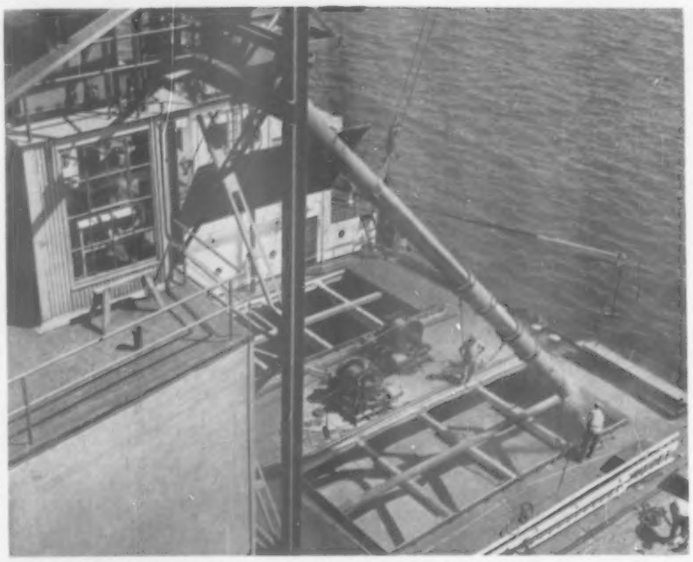
A new elevator-to-ship grain loading system installed by Toronto Elevators, Ltd., is believed to be unique in Canada.

The installation is described by A. D. Clark, vice president of Toronto Elevators, as a wager on the St. Lawrence Seaway bringing about further development of the port of Toronto as a transshipping point.

"The new system will allow us to handle grain in parcel or cargo lots, from 50 tons to 10,000 tons, most efficiently and in the least possible time," Mr. Clark said. "It will be most useful in assorted grain cargoes."

Toronto Elevators, he said, looks forward to its home city becoming a major port in the transshipping of grain overseas. Ocean going ships could discharge their cargoes at Toronto and take aboard a cargo, or part of a cargo, of grain destined for overseas ports.

The Toronto Harbor Commission is cooperating by informing large shipping companies of the new facilities put into operation by the firm and available for their use.



FAST OPERATION—The new grain out-loader installed by Toronto Elevators, Ltd., on the Toronto waterfront allows loading at the rate of 35,000 bu. an hour in cargo or part cargo lots. The spout, telescopic and easily maneuvered, is shown here in operation. The control room is at left.

SMOOTH START—A. D. Clark, vice president of Toronto Elevators, Ltd., at left, and Harry Wilson, elevator superintendent, discuss the operation of the fluid drive in the new grain loading system. At right is the chain conveyor which carries grain from the elevator shipping bins to the spout. It moves upward at a 45° angle.

The elevator and loading facilities will be available to other firms wishing to transship grain through the port of Toronto. It will be handled the same as grain shipped by Toronto Elevators itself in its capacity as grain merchants.

The out-loading system includes a chain conveyer and telescopic spout having a capacity of 35,000 bu. an hour. It is said to be the only shipping facility of its type on the continent with such a large capacity.

It has been in operation since the opening of the 1956 navigation season. Since then more than 60 boats have been loaded, averaging about 85,000 bu. a boat.

The chain conveyer, supplied by Buhler Brothers (Canada), Ltd., was built by the Canadian company's parent firm in Switzerland. The telescopic spout was designed by the C. D. Howe Co. and built by Shaeffer and Townsend of Hamilton. Electric motors were purchased from Canadian General Electric and gear reducers from Hamilton Gear and Machine.

Although the loader now is equipped with only one spout, three more may be added.

The chain conveyer system was chosen rather than a belt conveyer for three main reasons. It is dust proof and requires less space inside the elevator and less structural support outside.

Because less structural steel was required than for the conventional bridge type construction of belt conveyer and bucket elevator, the overall cost was less than that of a belt conveyer system.

The chain conveyer is equipped with fluid drive between the electric motor and gear reducers, insuring a smooth start even under full load. Every link in the chain is forged rather than cast, increasing the strength of the steel and enabling a higher capacity.

Inside the elevator there are four shipping bins used for outgoing grain. Grain is moved from other parts of the elevator by belt conveyers and bucket elevators, weighed, then discharged into the shipping bins.

The ship loading operation is carried out by only three men, one in the control room above the dock and the other two on the ship's deck. The control room operator is the key man. By means of buttons on an instrument panel he moves the grain from the shipping bin to the ship's hold.

Through the whole route, along the bottom of the elevator and upward to the spout, the grain is carried in the enclosed chain conveyer. The journey upward to the spout is made at a 45° angle outside the elevator at the dock side.

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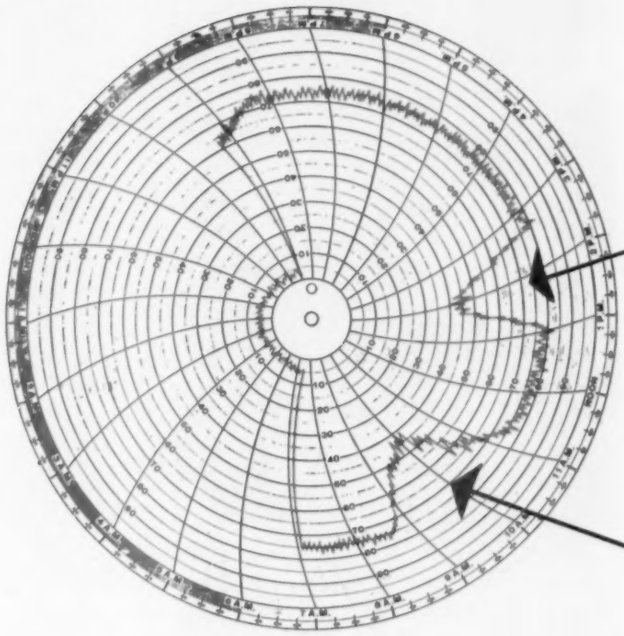

these mean trouble...

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